PROCEEDINGS

OF THE

CALIFORNIA ACADEMY OF SCIENCES

FOURTH SERIES

VOL. VIII, Nos. 8 and 9, pp. 309–351 JUNE 16, 1919

VIII

Report of the President of the Academy for the Year 1918

BY

C. E. GRUNSKY

President of the Academy

IX

Report of the Director of the Museum for the Year 1918

BY

BARTON WARREN EVERMANN

Director of the Museum

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PROCEEDINGS

Fourth Series

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Pages 49–56. New and Previously Unrecorded Species of Reptiles and Amphibians from the Island of Formosa. By John Van Denburgh. (*Issued December 20, 1909*)..... .25

Pages 57–72. Water Birds of the Vicinity of Point Pinos, California. By Rollo Howard Beck. (*Issued September 17, 1910*)..... .25

Pages 73–146. The Neocene Deposits of Kern River, California, and the Temblor Basin. By Frank M. Anderson. Plates II–XIII. (*Issued November 9, 1911*)..... 1.00

Pages 147–154. Notes on a Collection of Reptiles from Southern California and Arizona. By John Van Denburgh. (*Issued January 17, 1912*)..... .25

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VIII

REPORT OF THE PRESIDENT OF THE ACADEMY FOR THE YEAR 1918

BY

C. E. GRUNSKY

President of the Academy

Although no great event affecting the welfare and usefulness of the Academy can be announced as having occurred during the last calendar year, the Academy has nevertheless prospered and its membership may well be content with the fact that despite the adverse conditions which prevailed during the war, now happily ended, it has continued to function properly and its activities have not been seriously interrupted.

There has been but slight change in the number of members, as shown by the following summary:

The present membership in the Academy is 455, made up of:

Patrons	6
Honorary Members	32
Life Members	78
Fellows	14
Members	325

During the year 1918, 32 new members were admitted and the Academy lost by death 13, by resignation 18 and by being dropped for arrearages in dues 6.

Those who were called by death are as follows:

Mr. William Babcock	Member	January 23, 1918
Mr. Frederick H. Beaver	Member	July 23, 1918
Mr. George A. Clark	Member	April 27, 1918
Mrs. A. L. Coombs	Member	May 5, 1918
Hon. George W. Dickie	Member	August 17, 1918
Mrs. Sarah Vaslit Hackett	Life	November 3, 1917
Mr. William J. Hackmeier	Member	January 21, 1918
Judge Ralph C. Harrison	Life	July 18, 1918
Mr. Livingston Jenks	Member	November 11, 1918
Dr. Martin Krotoszyner	Member	April 20, 1918
Dr. Benjamin R. Swan	Life	January 27, 1918
Capt. Ignatius E. Thayer	Life	May 14, 1918
Mr. Joseph S. Tobin	Member	February 5, 1918
Mr. Clarence A. Waring	Member	November 4, 1918

The Academy carries on its list of patrons the following names:

Living

Mr. William B. Bourn
Mr. William H. Crocker
Mr. Peter F. Dunne
Mr. Herbert Fleishhacker
Mr. Joseph D. Grant
Mrs. Charlotte Hosmer
Mr. A. Kingsley Macomber
Mr. Alexander F. Morrison

Deceased

Mr. William Alvord
Mr. Charles Crocker
Mr. John W. Hendrie
Mr. James Lick
Mr. Ignatz Steinhart

The Treasurer's report for the year 1918 shows that the total receipts for the year were $67,885.96, of which $15,569.67 were paid out as interest. The receipts include $500.00 of the A. K. Macomber donation of $3500.00, which made the installation of the White Pelican group possible. Otherwise they are fairly representative of the annual gross income of the Academy. The floating debt of the Academy was reduced during the year by $14,000. The rest of the income has been consumed in maintaining the Academy's museum and in carrying on the activities of the Academy in its various departments. That these activities have been productive of good results is apparent in the increase of the Academy's scientific collections and in the publications of the Academy, and will be made clear, too, by the reports of the Director of the Museum and of the curators.

The Academy has published during 1918 the following papers in continuation of the Fourth Series of the Proceedings:

Vol. II, Part II, No. 12, pp. 1-187
A REVIEW OF THE ALBATROSSES, PETRELS AND DIVING PETRELS
by Leverett Mills Loomis.

Vol. VII, No. 12, pp. 319-330
REPORT OF THE PRESIDENT OF THE ACADEMY FOR THE YEAR 1917
by C. E. Grunsky.

Vol. VII, No. 13, pp. 331-364
REPORT OF THE DIRECTOR OF THE MUSEUM FOR THE YEAR 1917
by Barton Warren Evermann.

Vol. VIII, No. 1, pp. 1-25
IN MEMORIAM: THEODORE HENRY HITTELL.

Vol. VIII, No. 2, pp. 27-34
IN MEMORIAM: CARL FUCHS.

Vol. VIII, No. 3, pp. 35-112
SOME JAPANESE APHIDIDÆ
by E. O. Essig and S. I. Kuwana.

Vol. VIII, No. 4, pp. 113-156
GEOLOGY OF THE NORTHERN END OF THE TAMPICO EMBAYMENT AREA
by E. T. Dumble.

Vol. VIII, No. 5, pp. 157-179
THE KELP-FLIES OF NORTH AMERICA
by J. M. Aldrich

Vol. VIII, No. 6, pp. 181-270
THE GARTER-SNAKES OF WESTERN NORTH AMERICA
by John Van Denburgh and Joseph R. Slevin.

Vol. VIII, No. 7, pp. 271-308
NEW SPECIES OF HEMIPTERA CHIEFLY FROM CALIFORNIA
by Edward P. Van Duzee.

During the year 1918, 10 free lectures have been delivered at the stated meetings of the Academy, as follows:

JANUARY 16. The Sea Lions of the Pacific Coast of America.
Prof. E. C. Starks, Department of Zoology, Stanford University.

MARCH 20. Fishes of the Lake Bonneville Basin.
Prof. John O. Snyder, Department of Zoology, Stanford University.

APRIL 17. Sequoia National Park and its Extension.
Worth Ryder, Curator, Oakland Art Gallery.

MAY 15. Some Activities of the United States Department of Agriculture in California.
G. P. Rixford, Physiologist, Bureau of Plant Industry, U. S. Dept. of Agriculture.

JUNE 19. The Geography of Europe and the World War.
Prof. Earle G. Linsley, Department of Science.
Mills College.

JULY 17. The Influence of the Weather on Human Activities.
Edward A. Beals, District Forecaster, United States Weather Bureau.

AUGUST 21. The Early Days of the Academy.
Charles B. Turrill.

SEPTEMBER 18. The Ways in which Insects are Modified or Adapted to their Environment and Mode of Life.
Dr. Edwin C. Van Dyke, Professor of Entomology, University of California.

OCTOBER 16. Some Philosophical Considerations of Mathematics.
Dr. Rufus L. Green, Professor of Mathematics, Stanford University.

DECEMBER 18. Birds of the High Sierras and their Environment.
Dr. William F. Badè, President, California Associated Societies for the Conservation of Wild Life.

The Sunday afternoon lectures delivered in the Museum building during the year 1918 included the following:

JANUARY 6. Midwinter Birds of Golden Gate Park.
Dr. Joseph Grinnell, Director of the Museum of Vertebrate Zoology, University of California.

JANUARY 13. Fish and Game in California.
Dr. H. C. Bryant, Expert, Fish and Game Commission.

JANUARY 20. Forest Insects.
Prof. R. W. Doane, Department of Entomology, Stanford University.

JANUARY 27. Experiences in a Georgia Swamp.
Prof. J. C. Bradley, Department of Entomology, Cornell University.

FEBRUARY 3. Bird Life as seen through the Camera,
Dr. J. Rollin Slonaker, Department of Physiology, Stanford University.

FEBRUARY 10. California Petroleum.
Dr. Roy E. Dickerson, Curator of Invertebrate Paleontology, California Academy of Sciences.

FEBRUARY 17. Our Nearest Neighbor, the Moon.
Prof. E. G. Linsley, Department of Geology and Astronomy, Mills College.

FEBRUARY 24. The Crab Fisheries of the Pacific Coast.
Dr. F. W. Weymouth, Department of Physiology, Stanford University.

MARCH 3. The Pacific Whale Fisheries.
Dr. Harold Heath, Professor of Zoology, Stanford University.

MARCH 17. Animal Experimentation and Medical Progress.
Dr. F. M. McFarland, Professor of Histology, Stanford University.

MARCH 24. Life on Other Worlds.
Dr. R. G. Aitken, Astronomer, Lick Observatory.

MARCH 31. Influence of California's Topography and Climate upon Man's Work.
Prof. R. S. Holway, Department of Geography, University of California.

APRIL 7. Circulation of the Blood.
Dr. A. A. D'Ancona, San Francisco Board of Education.

APRIL 14. Geology of California.
Dr. J. Perrin Smith, Professor of Paleontology, Stanford University.

APRIL 21. Development in Teaching Geography.
Dr. Marsden Manson.

APRIL 28. The Banking Problems of the War.
Professor M. S. Wildman, Department of Economics, Stanford University.

MAY 5. The Hetch-Hetchy Water Supply.
M. M. O'Shaughnessy, City Engineer.

MAY 12. Collecting Bird Groups with Gun and Camera.
Paul Fair, Department of Exhibits, California Academy of Sciences.

MAY 19. The Value to Mankind of Humanely Conducted Experiments, upon Living Animals.
Dr. F. B. Sumner, Biologist, Scripps Institution for Biological Research.

OCTOBER 6. The Changes in the Newtonian Law of Gravitation indicated by the latest researches on the Motions of the Planets and of the Moon.
Dr. T. J. J. See, Professor of Mathematics, United States Navy.

OCTOBER 13. The coming Commonwealth of Man.
Edward Berwick, Member of the Institute of International Law.

NOVEMBER 24. Animal Life of the Apache Trail, Arizona.
Harry S. Swarth, Curator of Birds, Museum of Vertebrate Zoology, University of California.

DECEMBER 1. Some Activities of the United States Department of Agriculture in California.
G. P. Rixford, Physiologist, Bureau of Plant Industry, United States Department of Agriculture.

DECEMBER 15. Building of the first Transcontinental Railroad.
Charles B. Turrill.

DECEMBER 22. The Application of the Science of Geology in Exploration for Oil.
Dr. Bruce L. Clark, Department of Paleontology, University of California.

DECEMBER 29. The Lessons of the Southeast Wind.
Dr. Marsden Manson.

In the matter of the Ignatz Steinhart bequest of $250,000 to the Academy for the erection and equipment of an aquarium in Golden Gate Park, it can now be reported that the city through a charter amendment, adopted at the election last November, has been definitely committed to an acceptance of the conditions named in the bequest. Your Board of Trustees, too, has signified to the Executors of the Estate their acceptance of the trust imposed by the Steinhart will. There are, therefore, no obstacles in the way of proceeding with the making of plans and the erection of the building except only those incident to settling up an estate which consists in large part of real estate for which there is no immediate demand.

Since the close of the year of which this report is a brief record, the Council of the Academy has been advised by Mr. John W. Mailliard and Mr. Joseph Mailliard that their large and valuable collection of eggs and bird skins is to be donated to the Academy. The plan of transfer, tentatively suggested and which will within a few days be put into effect, will obligate the Academy to immediately furnish space for a part of the collection, which the Mailliard brothers desire to have adequately housed in the Museum building. The rest of the collection will follow from time to time at their pleasure; but the question of ultimate ownership will be at once definitely settled.

The Academy is fortunate indeed to thus acquire the results of the lifetime work of two enthusiastic students of birds, who have both long been active members of the Academy; and I take this occasion to express the Academy's deepest gratitude to the donors. May they continue to take the same satisfaction and pleasure in the collection in a new home as they have heretofore.

Preliminary announcement should be made, too, of the fact that under the terms of the will of the late S. Field Thorn, long a resident of San Francisco, the Academy is to receive a tract of land near Santa Cruz, containing about 240

acres. Apart from the advantage that would come to the Academy by being thus placed in possession of more property, if the desire of the testator be not frustrated, with corresponding increase of opportunity to be of service in the advancement of science, such bequests show that the Academy's work and its efforts to be of service in the community are being appreciated in ever widening circles.

The accessions to the Museum and Library for the year 1918 may be summarized as follows:

Department of Botany

By Exploration	1216	specimens
By Gift	805	
By Exchange	1005	
By Purchase	1230	
	4256	

Department of Entomology

By Exploration	10,019	specimens
By Gift	5,116	
By Exchange	43	
	15,178	

Department of Herpetology

By Exploration	1119	specimens
By Gift	605	
	1724	

Library

Books, pamphlets and excerpts

By Gift	1077	

Department of Paleontology

By Exploration	447	specimens
By Gift	339	
	786	

Numerous boxes of fossils, shells and minerals.

Department of Ornithology

Important accessions of skins, nests and eggs of birds.

Department of Mammalogy

By Gift	139	specimens

In the Mammal Hall of the Museum the fur-seal group is under preparation. In the Bird Hall the generosity of Mr. Herbert Fleishhacker and of Mr. A. K. Macomber has made possible the installation of two more attractive large-size habitat groups, that of the Water-Fowl group of San Joaquin Valley and the White Pelican group respectively. These were

both opened to the public during the year and it may be noted that the artistic finish of the background paintings by Capt. Chas. B. Hudson, has received much favorable comment and so, too, the general arrangement and the grouping of the birds by Mr. Paul Fair. A number of the smaller groups, too, have been added in this hall.

For large exhibits the space in the Bird Hall is now exhausted, and there are but two alcoves not yet in use in the Mammal Hall. The space which the new building provided a few years ago, is already practically in full use. The Academy needs an auditorium. This is evidenced by the large attendance at the popular Sunday afternoon lectures, for which the space temporarily provided is not well suited. This space should be added to the Bird Hall. The need is pressing, in other words, for another section of the Museum building. May we not hope that, recognizing this need and the earnest endeavor of the Academy to be of public service, that some one or more of those of this community who have the means to do so will come to the Academy's aid in this matter and provide the funds which would enable an expansion of its museum and of its general activities.

The activities in the several departments are fully set forth in the reports of the Director of the Museum and of the Curators. I need only say that the work that is being done is creditable to the Academy and that there is no lack of interest and endeavor to meet the task which the Academy has made its own.

The time has now come for making some effort to increase the membership of the Academy. Our dues are nominal, only $5.00 per annum, and there is no admission fee. Any one interested in science or desiring to aid in the advancement of science is eligible to membership. The Council plans to name and maintain a membership committee and requests that notice be sent of any person desiring to become a member.

On behalf of the Officers of the Academy, I desire to again express their appreciation of the support which they have received from the membership in their efforts to make the Academy useful and of service to the public. I take pleasure, too, in acknowledging the faithful service which has been rendered by its staff of employees.

IX

REPORT OF THE DIRECTOR OF THE MUSEUM FOR THE YEAR 1918

BY

BARTON WARREN EVERMANN

Director of the Museum

The annual report of the Director for the year 1917 was presented to the Academy at the annual meeting of February 20, 1918. At that time the following habitat groups had been completed:

Large groups: San Joaquin Valley Elk, Columbian Black-tailed Deer, Rocky Mountain Mule Deer, Antelope, Desert Mountain Sheep, Stellar's Sea Lion, California Sea Lion, Leopard Seal, Farallon Islands Bird Rookery, San Joaquin Valley Bird Group, Desert Bird Group, San Joaquin Valley Water-Fowl Group, and California Condor.

Intermediate groups: Mountain Lion, Northwestern Black Bear, Raccoon and Striped Skunk, and Coyote.

Small groups: California Ground Squirrel, Santa Cruz Chipmunk, California Valley Quail, California Clapper Rail, California House Finch, and Coast Bush-Tit. The installation of the Sulphur-bottom Whale skeleton had also been completed. During the past year the following habitat groups have been completed:

White Pelican.—This is one of the most interesting and instructive, as well as beautiful, groups that have been installed. It represents a portion of the breeding ground of the White Pelican on Anaho Island in Pyramid Lake, Nevada.

This rookery was selected in preference to any of those in California (Buena Vista Lake, Eagle Lake, and Klamath Lakes) because the topography presented an exceptionally fine setting for the group. More than 10,000 birds nest on this small island. The group was prepared by Mr. Paul J. Fair, assisted by Mr. Arthur L. Reed and Miss Olive E. Cutter. The background was painted by Charles Bradford Hudson.

The Academy has been able to install this very beautiful exhibit through the liberality of Mr. A. K. Macomber of Paicines and Burlingame, who very generously met the expense connected with its preparation.

Nuttall Sparrow.—This is one of the small panel groups. It shows a pair of this subspecies of the White-crowned Sparrow and their nest placed in a Yellow Lupine *(Lupinus arboreus)* as found in the sand dune region in the western part of Golden Gate Park.

As the Nuttall Sparrow is the most abundant and most familiar permanent resident of all the birds of the Park, this group is of unusual interest to the school children who visit the Museum.

This group was prepared by Mr. Fair, assisted by Mr. Reed and Miss Cutter. The background was painted by Miss Cutter.

Sharp-Shinned Hawk.—This is another of the small panel groups. The Sharp-shinned Hawk is of occasional occurrence in Golden Gate Park where it is destructive to the smaller birds. In the group a hawk of this species is shown with a Western Bluebird in its talons. The brightly colored foliage is that of the Poison Oak.

We therefore have completed at this date 14 large, 25-foot groups (eight mammal and six bird), four intermediate, 10-foot groups (all mammals), and eight small panel groups (two mammal and six bird).

Other groups now in preparation are the Fur-Seal (nearly completed), the Roosevelt Elk, the Water Ouzel (nearly completed), and the Audubon Cottontail *(Sylvilagus auduboni)*.

PERSONNEL

Only one or two slight changes in the personnel of the Museum have occurred within the year. Mr. James H. Chastain, janitor, resigned March 31 to engage in mining operations, and assistant janitor Wm. C. Lewis was promoted to janitor. On the same date Mr. Fred Maag was appointed assistant janitor and carpenter. On April 1, Mr. Geo. W. Edwards was appointed assistant janitor. Mr. Joseph R. Slevin, assistant curator of Herpetology, having been com-

missioned an ensign in the United States Navy, was granted indefinite leave of absence without pay July 31. He returned to duty February 1, 1919. Miss Mary E. McLellan was appointed check-room attendant March 16, 1918, and on August 1, promoted to the position of library assistant.

The employees of the Academy at this date are the following:

Dr. Barton Warren Evermann, Director and Executive Curator of the Museum, and Editor; W. W. Sargeant, Secretary to the Board of Trustees; Miss Susie Peers, Stenographer and Typewriter; Joseph W. Hobson, Recording Secretary; Miss Alice Eastwood, curator, Department of Botany; Edward P. Van Duzee, curator, Department of Entomology and assistant librarian; Dr. John Van Denburgh, curator, Department of Herpetology; Dr. Roy E. Dickerson[1], curator, Department of Invertebrate Paleontology; Dr. Walter K. Fisher, curator, Department of Invertebrate Zoology; Paul J. Fair, chief taxidermist; Charles Bradford Hudson, artist; Joseph R. Slevin[2], assistant curator of Herpetology; John I. Carlson[3], general Museum assistant; Arthur L. Reed, assistant, Department of Exhibits; Miss Olive E. Cutter, assistant, Department of Exhibits; Mrs. Marian L. Campbell, assistant, Department of Botany; Mrs. Helen Van Duzee, assistant, Department of Entomology and in the Library; Miss Mary E. McLellan, library assistant; Georges Vorbe, assistant, Department of Paleontology; Merle Israelsky, assistant, Department of Paleontology; Raymond Smith, general assistant; Wm. C. Lewis, janitor; Fred Maag, assistant janitor and carpenter; Geo. W. Edwards, assistant janitor; Frank W. Yale, night watchman; Mrs. Johanna E. Wilkens, janitress; Patrick J. O'Brien, day watch.

ACCESSIONS TO THE MUSEUM

As in previous years, the accessions to the Museum have been numerous as shown by the detailed list in the appendix to this report. A few of the more notable ones are referred to in the President's report (pp. 314-315).

[1] On leave with the Standard Oil Company since June 30.
[2] On leave in the U. S. Navy since July 31.
[3] On leave since March 15.

VISITORS TO THE MUSEUM

On account of the prevalence of Influenza in San Francisco the Museum was closed to the public from Saturday, October 19, to Saturday, November 16, both inclusive. With the exception of this period of 29 days, the Museum has been open to visitors every day.

Although the attendance has been large it has, of course, suffered somewhat on account of war conditions and especially the Influenza. The daily visitors have varied from a few hundred on stormy days to more than 9000 on favorable days.

The public and private schools not only of San Francisco but of the transbay cities continue to visit the Museum, the teachers bringing the entire school to study the habitat groups and other educational exhibits. The Director endeavors, whenever possible, to conduct the classes about the Museum and explain the various exhibits. When time permits the schools are taken into the lecture hall where a special lesson is given with stereopticon slides and moving pictures on some one of the groups. The children thus leave the Museum with at least one lesson clearly impressed on their minds.

The attendance by month during the year 1918, was as follows:

January	25.260
February	23,698
March	26,810
April	23,274
May	26,391
June	29,843
July	31,420
August	31,137
September	29,847
October	14,743
November	8,531
December	19,588
Total	290,542

LECTURES

A course of free popular lectures on scientific subjects has been maintained throughout the year, on the third Wednes-

day evening of each month. These have been given at the regular monthly meetings which, through the courtesy of the Engineers' Club of San Francisco, have been held in the hall of that society on the ninth floor of the Mechanics' Institute building. The list of lectures and their subjects will be found in the President's report (pp. 311-312).

The Academy has continued the Sunday afternoon course of popular lectures which were begun October 22, 1916, soon after the Museum was formally opened to the public. These lectures are given in the auditorium of the Museum at 3 o'clock each Sunday afternoon. The popularity of the course remains undiminished; the size of the audiences has been limited only by the size of the auditorium. The lecture committee for the year, Mr. W. W. Sargeant, Miss Alice Eastwood and Mr. Paul J. Fair, has been energetic and resourceful in securing lecturers and arranging the details for these lectures. A list of the lectures given in 1918 will be found on pages 312-314 of the President's report.

Attention is again called to the fact that the Academy has no funds from which to meet even the slight expense connected with these lectures. It is hoped that some friend of the Academy who feels an interest in the educational work it is doing may provide a small endowment the income from which can be applied to the expenses of public lectures.

FIELD WORK OF THE MUSEUM STAFF

Within the year the Museum conducted a number of important field investigations, as follows:

Channel Islands.—During the latter part of March (March 22-31) the Museum sent an expedition to the Channel Islands off the coast of southern California. The party consisted of the Director of the Museum, the Curator and Assistant Curator of the Department of Herpetology, Mr. Joseph Mailliard of San Francisco, and Mr. J. Eugene Law of Los Angeles. Through the courtesy of the California Fish and Game Commission the party was able to visit San Clemente, San Nicolas, Santa Barbara, and Santa Catalina islands. This opportunity is taken to express to the officials of the Fish and Game Commission, especially Mr. Carl Westerfeld, Executive

Secretary; Mr. N. B. Scofield, assistant in charge of commercial fisheries; and Captain H. B. Nidiver of the Commission's patrol boat Albacore, the appreciation of the members of the party of the courtesies extended. Captain Nidiver did everything possible to enable the party to work effectively during the entire period of the trip. Equal appreciation must be expressed also to Mr. E. G. Blair, President of the San Clemente Sheep Company, for permission to land on San Clemente Island and for making our stay on that island very pleasant. We are also indebted to Captain H. W. Rhodes, Inspector 18th Lighthouse District, for permission to land on several lighthouse reservations.

The trip to the islands proved quite successful. A large collection of lizards was obtained on San Clemente, and considerable collections of birds, nests and eggs, insects, shells, and plants were obtained from the various islands. One interesting result of the expedition was the addition of several birds to the known fauna of the islands, including the Pied-billed Grebe and Arkansas Kingbird on Santa Catalina; a species of Junco (probably Thurber's), Western Chipping Sparrow, Lincoln Sparrow, Dusky Warbler, and Audubon Warbler on Santa Barbara, and what was believed to be the Cactus Wren on San Clemente[4].

Northern California and Southern Oregon.—From May 29 to July 7, a party consisting of the Director of the Museum and the Curator and Assistant Curator of Herpetology made a collecting trip through northern California and southern Oregon chiefly in the interests of the departments of Herpetology and Ornithology. The expedition was a camping trip and large and valuable collections of reptiles and birds' nests and eggs were obtained.

USE OF THE ACADEMY'S COLLECTIONS AND LIBRARY BY INVESTIGATORS AND STUDENTS

Students and investigators in the various departments have continued to avail themselves of the facilities for study and research which the Academy is always glad to supply. Space will permit the mention of only a few of the specialists who have made use of our collections. Dr. Joseph Grinnell has

[4] See Joseph Mailliard in the Condor, XX, No. 5, September-October, 1918, p. 189.

consulted the collections of wood rats and elk. The ornithological and oological collections have been consulted by a large number of students of birds, including L. M. Loomis, Joseph Mailliard, Harry S. Swarth, Joseph Grinnell, John Van Denburgh, O. P. Silliman, Roswell Wheeler, Donald G. Cohen, Harold C. Hansen, Chase Littlejohn, and others.

In Entomology, practically all the entomologists of California have made frequent use of the collections. Among those who should be especially mentioned are Dr. Frank E. Blaisdell, Dr. E. C. Van Dyke, Mr. Lawrence R. Reynolds, Mr. Ralph Hopping, Prof. F. C. Fall, Prof. J. M. Aldrich, Mr. Walter M. Giffard, Mr. Wm. F. Breeze, Mr. Chas. L. Fox, and many others. The curator of this department has been particularly active and successful in securing the cooperation of specialists to identify our collections in the various groups, as set forth fully in the curator's report. Dr. Blaisdell particularly has rendered very valuable service in identifying the Coleoptera.

The collections and publications in the department of Paleontology have been consulted by many of the paleontologists, malacologists, and geologists of the Pacific Coast, among whom should be mentioned Professor Charles W. Weaver, and Miss Katheryn Van Winkle of the University of Washington; Dr. Earl L. Packard of the University of Oregon; Dr. Bruce L. Clark of the University of California; Dr. W. S. W. Kew, associate geologist, U. S. Geological Survey; Mr. Clark Gester, geologist, Southern Pacific Company; Mr. Parker Trask, Mr. Anthony Folger and Miss Esther Richards, graduate students, University of California; Professor Woodruff, Pomona College; Mrs. Ida S. Oldroyd, Stanford University; Mr. F. M. Anderson, consulting geologist; Dr. J. O. Nomland, geologist, Standard Oil Co., and several others.

In the department of Botany practically all the botanists of California have made use of the herbarium in verifying their identifications of specimens or in other ways.

In addition to this, much of the time of the Director and Curators has been employed in answering questions or supplying information requested by correspondents or visitors. As the Museum becomes better known and specialists and students

come to understand that we are always ready to be of service, the requests for information increase in number. While this takes much time of the Director and Curators, it is proper educational work and real service which the Museum is always glad to render.

RESEARCH WORK

The members of the Museum staff have been active in research and scientific investigation. They have contributed a number of papers to scientific literature, among which the following may be mentioned:

Van Denburgh, John and Slevin, Joseph R.

1. The Garter-Snakes of Western North America. <Proc. Calif. Acad. Sci., Fourth Ser., Vol. VIII, No. 6, pp. 181-270, pls. 7-17, October 18, 1918.

Van Duzee, Edward P.

1. New Species of Hemiptera chiefly from California. <Proc. Calif. Acad. Sci., Fourth Ser., Vol. VIII, No. 7, pp. 271-308, October 18, 1918.

Evermann, Barton Warren

1. Notes on some Adirondack Reptiles and Amphibians. <Copeia, No. 56, April 15, 1918, pp. 48-51.
2. Notes on some Reptiles and Amphibians of Pike County, Pa. <Copeia, No. 58, June 18, 1918, pp. 66-67.
3. George Archibald Clark. <Science, n. s. XLVIII, No. 1235, August 30, 1918, pp. 213-215.
4. Notes on some Reptiles and Amphibians of Waterville, New Hampshire. <Copeia, No. 61, September 15, 1918, pp. 81-83.
5. Note on Flyingfishes. <The Catalina Islander, Vol. V, No. 42, November 5, 1918, p. 4.
6. The Unionidæ of Lake Maxinkuckee. <Proc. Ind. Acad. Sci, 1917, pp. 251-285. (Senior author with Howard Walton Clark.)
7. Fisheries Experiment Stations. <Pacific Fisherman, Vol. XVI, No. 12, December, 1918, p. 11.

DEPARTMENT ACTIVITIES

Although war conditions disorganized the work of the Museum to some extent the curators and their assistants have, as always, been active and efficient in increasing and caring for the collections in different departments, and in research work based upon the collections of the Museum. The condition and activities of the different departments are fully set

forth in the reports of the respective curators and need be referred to here only briefly.

The Department of Entomology did considerable field work. The curator, Mr. E. P. Van Duzee, spent four weeks in Shasta and Siskiyou counties, California, and Jackson County, Oregon, during which important collections were obtained. He also made numerous shorter collecting trips to the vicinity of Los Baños, Sacramento, Mt. St. Helena, Cazadero, and elsewhere.

The Department of Paleontology.—Although Dr. Dickerson, the curator of this department, has been on leave most of the year, he nevertheless did some work on the Petaluma, Sonoma and Tomales quadrangles which added materially to our knowledge of those regions and to the Academy's collections of fossils. During the time the curator has been on leave he has had opportunity to do some collecting for the Academy.

Department of Botany.—Miss Eastwood, the curator of this department, has continued with her characteristic energy and industry to build up and care for the Herbarium which now contains more than 50,000 specimens all properly identified and authenticated, besides many specimens of fungi not yet fully determined. Many important additions to the Herbarium have been made during the year as set forth in detail in the curator's report.

Department of Herpetology.—The curator and assistant curator have been active in enlarging, caring for, and studying the collections of this department. Two important collecting trips were made, one in March to the Channel Islands, the other in June and July through northern California and southern Oregon, which added more than 1000 specimens to the collections. The total accessions in the year number 1724, and the total number in the department now exceeds 37,000.

Department of Ornithology.—Such field work as was done in the interest of this department was chiefly in the section of oology, to which very little attention has hitherto been given. The total number of specimens added to the Academy's collection of nests and eggs during the year exceeds 1600, some of them rare and of unusual interest. During the nest-

ing season the Director made numerous short week-end collecting trips to Los Baños and other nearby fields. One longer trip was made to the Channel Islands in March, and another in June and July through northern California and southern Oregon, which added greatly to the Academy's oological collections. Suitable cases have been provided in which these collections are now being arranged.

Department of Mammalogy.—No effort has been made to enlarge the collections in this department. A few miscellaneous specimens were, however, received, including specimens chiefly from Marin County donated by Mr. Charles A. Allen, the veteran naturalist and collector of San Geronimo, and 87 specimens chiefly from California, donated by the well-known collector, Mr. J. August Kusche.

A considerable number of mammal skulls having accumulated, Miss Lula M. Burt, an expert preparator, has been employed for some weeks in cleaning skulls and skeletons. More than 1200 skulls have already been cleaned by Miss Burt.

Department of Invertebrate Zoology.—The curator of this department, Dr. W. K. Fisher, was invited by Dr. C. C. Nutting of the University of Iowa to accompany an expedition organized by that institution for study of the marine fauna of the Lesser Antilles. Through an arrangement with Stanford University, Dr. Fisher was permitted to represent the Academy and that institution. He sailed from New York for the Antilles April 19th and returned August 1st. Collecting was done about Antigua and the Barbados and considerable collections of marine invertebrates were obtained.

Some work was done by the department at the San Juan Islands, Puget Sound, where important collections were obtained for the Academy by Mrs. Ida S. Oldroyd.

Library.—Very gratifying progress has been made in putting the library in proper shape, especially in accessioning the volumes. More than 8000 volumes have been accessioned. These include all the volumes on the second floor and all those in the departments of Ornithology, Herpetology, Botany and Paleontology. Valuable assistance has been rendered the librarian by Miss Mary E. McLellan and Mrs. Helen Van Duzee.

The Academy has not had available the funds really necessary for the proper growth of the library, nevertheless the accessions have numbered about 400 complete volumes and several hundred pamphlets.

THE ACADEMY AND THE WAR

Many members of the Academy, including several of the Museum staff, were active in war work of one kind or another. The Academy's service flag contains 17 stars. Mention should first be made of those who were in actual war service. The list includes the following:

ALBERT L. BARROWS. Entered Officers Training Camp May, 1917; commissioned in August First Lieutenant, Cavalry; at Camp Lewis in August given commission First Lieutenant, Infantry; was made Adjutant of the 347th Machine Gun Brigade; embarked for France July, 1918; still in France.

CHARLES L. CAMP, First Lieutenant, Field Artillery, American Expeditionary Forces, France.

CHARLES T. CROCKER, Chief Petty Officers January 5, 1918. Commissioned as Ensign, January 13, 1919. Detailed to the Naval Communication Service in Third Naval District, in Office of Cable Censorship. Still in active Service.

WILLIAM WELLER CURTNER. Entered the service October 14, 1918; sent to Vancouver Barracks, Washington; placed in the 15th Casual Detention Company of the Spruce Production Division. Honorably Discharged December 13, 1918.

MERLE ISRAELSKY, Aid Department of Paleontology, California Naval Unit, October 11 to December 21, 1918.

CHARLES A. KOFOID, Major, Sanitary Corps, National Army, January, 1918. Still in service.

NORMAN B. LIVERMORE. Entered U. S. Army Service September 2, 1917. In October, 1917, commissioned as Captain of Engineers and sent to France. In France during the close of 1917 and entire year of 1918. Promoted to Major in the fall of 1918. Discharged about the middle of January, 1919, in the United States.

WAYNE F. LOEL. Enlisted June 29, 1918, and assigned to 115th Engineers at Camp Kearny; entered Engineers Officers Training School at Camp A. A. Humphreys September 19, 1918; discharged at Camp Humphreys November 27, 1918.

ATHOLL MCBEAN, Director of the Bureau of Personnel, Pacific Division, the American Red Cross, February 1 to April 24, 1918. Deputy Commissioner of the Switzerland Commission of the American Red Cross, and Director of American Prisoner Relief, April 24 to October 31, 1918.

WILLIAM W. PRICE, Captain, American Red Cross, Director of Red Cross Base Hospital, Camp Fremont, January 20, 1918, to October 12, 1918.

WILLIAM G. REED, Captain, Signal Corps, Aviation Section, American Expeditionary Forces, France.

LAURENCE R. REYNOLDS, General Staff of the War Department, October 17, 1918, to November 1, 1918.

THOMAS J. J. SEE, Captain U. S. Navy, Mare Island, California.

JOSEPH R. SLEVIN, Assistant Curator, Department of Herpetology. Ensign U. S. Naval Reserve, July 22, 1918. Promoted to Lieutenant January 24, 1919; released from active duty January 25, 1919. Service on the U. S. S. Beaver.

STANLEY STILLMAN, Lieutenant Commander, U. S. Navy. Commander U. S. Navy Base Hospital No. 2, Scotland, December, 1917, to January, 1919.

TRACY I. STORER, First Lieutenant, Sanitary Corps, Laboratory Car "Metchnikoff", Fort Sam Houston, Texas.

LANSING K. TEVIS, First Lieutenant, Aviation Service.

JOSEPH C. THOMPSON, Medical Director, U. S. Navy.

F. VICKERY, Lieutenant, U. S. Army.

CHARLES E. VON GELDERN, First Lieutenant, U. S. Medical Corps, Camp Fremont, California.

In addition to those engaged in actual war service a great many members of the Academy rendered important service to their country; indeed, it can be truthfully said that practically the entire membership of the Academy rendered valuable service in one way or another. Some were engaged in Red Cross, Y. M. C. A., or Liberty Loan work, while others served on important scientific and other committees working in connection with the National and State Councils of Defense, the Federal Food Administration, and other Federal or State agencies. One of these was the Committee on Scientific Research of the State Council of Defense for California, practically the entire membership of which was made up of members of the Academy, as was also that of each of the several special committees (Geology, Oil, Zoological Investigations, etc.) working under the general authority of the State Council of Defense and directly under the Committee on Scientific Research.

Some of the more important committees may be given here. The members of the Academy are indicated by the star.

Pacific Coast Research Committee of the Pacific Division of the American Association for the Advancement of Science: John C. Merriam, Chairman; *Douglas H. Campbell; *W. W. Campbell; *Barton W. Evermann; *E. C. Franklin; A. O. Leuschner; D. T. MacDougal; Geo. H. Whipple.

Committee on Botanical Investigations: *Harvey M. Hall, Chairman; *Douglas H. Campbell; *Wm. A. Setchell.

Committee on Entomological Investigations: *W. B. Herms, Chairman; *R. W. Doane; *E. O. Essig; G. P. Weldon.

Committee on Zoological Investigations: *Barton Warren Evermann, Chairman; *Harold C. Bryant; W. C. Crandall; *S. J. Holmes; *Charles A. Kofoid; *Frank M. MacFarland; *Wm. E. Ritter; *Norman B. Scofield; *J. Rollin Slonaker; *John O. Snyder; *E. C. Starks.

*Doane, R. W., Chairman, Committee on Entomological Investigations of the Pacific Coast Research Conference. Since December, 1917, Consulting Entomologist of the Federal Food Commission for California.

*Hall, Harvey M., Member of the Committee on Botanical Raw Products of the National Research Council. Vice-Chairman of the Sub-committee on Botany of the Pacific Coast Research Conference.

*Lilienthal, Jesse W., Chairman of the War Camp Community Service, Vice-Chairman of the San Francisco Chapter of the American Red Cross, and President of the Boy Scouts of San Francisco. Division Commander in both of the Red Cross drives, and State Chairman of the United War Work Campaign.

*Mailliard, Joseph, Operative and assistant chief of San Francisco Branch, American League, Auxiliary to U. S. Department of Justice, August 15, 1918, to February 1, 1919.

DEPARTMENTAL REPORTS

DEPARTMENT OF BOTANY

By Alice Eastwood, *Curator*

The herbarium of the California Academy of Sciences now numbers 50,559 specimens all mounted and classified according to the latest system. It includes both Phanerogams and Cryptogams. Altogether there are 3116 genera and 17,112 species.

The Cryptogams are not so well represented as the Phanerogams, but there are some notable collections. Among the Lichens is the Hasse collection which has been purchased by the Academy. It furnished the material for "Contributions from the U. S. National Herbarium, Vol. 17, part 1, The Lichen Flora of Southern California by Hermann Edward Hasse". The total collection of lichens contains 89 genera, 320 species, and 394 specimens. The collection of mosses contains 140 genera, 298 species, and 674 specimens most of which were donated by Dr. C. Hart Merriam. The collection of hepatics contains 13 genera, 21 species, and 40 specimens.

The collection of fungi is the most valuable of the Cryptogams since it consists of the 474 types from the Harkness collection which were saved from the great fire. A few have been added from time to time by the curator, but are at present unlisted as the determinations are uncertain.

Besides these types of California fungi, there are 1855 Phanerogams, most of which were also saved from the fire, and eleven Galapagos types and cotypes of Allocarya recently determined by C. V. Piper. This material was loaned to the National Herbarium and the results of Mr. Piper's studies will soon appear in one of the contributions from the National Herbarium. The Academy's herbarium contains also a number of new species to be described soon, which will add to the accumulation of types.

The additions to the herbarium have come in various ways; 1005 specimens were received in exchange, 807 came as gifts from 24 different donors, most of them being specimens for identification. The curator added 1300 specimens and many duplicates. Besides the Hasse collection of lichens the Academy purchased the valuable mounted collection of Idaho specimens which formed the herbarium of John M. Holzinger. These plants were collected in the region traversed by the Lewis & Clark Expedition and the report on them was published by Professor Holzinger in Contributions from the U. S. National Herbarium, Vol. III, No. 4.

The southern California branch of the U. S. Forest Service presented the Academy with its herbarium. This consisted of 149 mounted sheets, chiefly specimens of Eucalyptus, representing almost as many species as specimens; also 93 bottles containing seeds of 86 species of Eucalyptus. This is a valuable addition to our herbarium and will be of great assistance in identifying the numerous species of this difficult genus so widely cultivated in California.

The Botanical Club numbers sixty-five members and holds weekly meetings. These are chiefly field trips, some in Golden Gate Park to study the exotics and others in the San Francisco Bay region, where cultivation

has not destroyed the native flora. These out-of-doors excursions can be held all winter and are not only more instructive than lectures or books, but more enjoyable. A weekly class of the gardeners of Golden Gate Park is also conducted in the evening at the herbarium so as to enable these men to have correct knowledge of the plants under their care. They bring in specimens which are useful in the Museum flower show. This exhibition of the native and exotic plants blooming throughout the year out-of-doors in San Francisco and around the Bay has been one of the most popular of the educational influences of the Academy and is greatly appreciated by the flower-loving public. Without the faithful care of Mrs. Johanna Wilkens, who has kept the water replenished, the shelves clean and the dead flowers removed, it would be impossible to keep up this exhibition in a satisfactory manner. Each species is labelled with scientific and common name and native country.

The framed pictures of edible and poisonous mushrooms in the little room off the vestibule have lured the lovers of mushrooms to the herbarium to discover the good or bad qualities of many that are common chiefly in the Park. On account of the lack of literature it has not been possible to answer all these inquiries. A collection of wax models, correctly colored and named would be a valuable addition to the Museum and I would like to suggest that a beginning be made during the ensuing year. A complete collection would have to be the work of many years and it would be necessary to send those that are unknown to authorities for correct naming.

At last, Mr. McLaren, the superintendent of the Park, has begun the planting of the court back of the Museum with trees and shrubs common in the Park but arranged, when possible, in the scientific sequence of families, so that it will be a botanical garden of a new kind and instructive as showing the evolution from the lower to the higher orders.

The plot of ground which faces the court is soon to be planted with trees and shrubs of the Bible and a small plot of ground has been reserved for the plants mentioned in Shakespeare's plays. These groups of plants will be of great interest to many people. However, without labels they will have no educational value and I would like to suggest that the Academy purchase a labelling machine so as to permanently label these plants as well as making a beginning towards labelling the trees and shrubs throughout the Park.

The curator had a leave of absence in May and June and was away six weeks. Part of the time was spent in collecting and collections were made at Portola and Loyalton in California, and in Buena Vista, Leadville, Glenwood Springs, Grand Junction in Colorado, at Thompsons Springs, Soldiers Summit, Thistle and Salt Lake in Utah. Earlier in the year a trip was made to Downieville, also to Tres Pinos and San Benito, to study the willows. Professor C. S. Sargent paid the railroad fare on these short trips. The expenses of the trip to Colorado were paid by the curator.

As new specimens have come in, they have been mounted, and much back work that had to be left undone has been completed, so that we are now about caught up and shall begin the new year of the Academy with the collections that have come in recently but are not yet incorporated into the herbarium.

These collections include an herbarium of 1464 specimens collected by the late Dr. E. K. Abbott of Salinas and Monterey, and presented to the Academy by his widow; 48 specimens from Afognak, Alaska, collected and donated by Russel Noyes; 26 unnamed specimens from Canton, China, collected and donated by Caroline Rixford Byrd; also at Mrs. Byrd's suggestion, 199 specimens from southern China donated by the Christian College, Canton, China. A collection of 200 desert plants collected by Roxana S. Ferris in southern California and Arizona has been purchased by the Academy.

A great many duplicates have been distributed to various botanical centers with which the Academy exchanges. Some of these were in return for what had already been received, while others have been sent in expectation of returns to be later received.

The Arnold Arboretum	305
U. S. National Museum	1631
Gray Herbarium, Cambridge, Mass.	933
New York Botanical Garden	713
Missouri Botanical Garden	253
Ira W. Clokey, Denver, Colo.	864

Besides these there have been distributed through the Arnold Arboretum duplicates of Yukon trees and shrubs collected in 1914 to the following:

Geological & Natural History Survey of Canada	318
U. S. National Museum	397
Royal Herbarium, Kew, England	256
Missouri Botanical Garden	216

Through the valuable help of my assistant, Mrs. Marian L. Campbell, we have at last caught up with the accumulated piles of unmounted specimens and the new year will see the mounting of the accessions as they come in. Mrs. Campbell has mounted 6039 specimens and Mrs. E. C. Sutliffe has mounted the collection she made in Sierra and Plumas counties in the summer of 1918, consisting of 138 specimens which she has donated to the herbarium.

The list of accessions will be given in the general report of accessions.

Besides the popular Sunday lectures which the curator has given at the Academy, many informal talks on trees and flowers have been given to various clubs and to flower shows. These help to extend the influence of the Academy in popularizing science.

DEPARTMENT OF ENTOMOLOGY

E. P. Van Duzee, *Curator*

The significant work in the department of entomology during the past year was the development of the collection of North American insects, the important nucleus about which must be elaborated all future activities of

this department. Until we know our home insects we can be of little service to enquiring beginners in entomology; nor can we make our work interesting to the general public or properly carry on the investigations of a more technical nature which devolve upon this department of the Academy.

Additions to the department of entomology during the past year number 17,152 specimens of which 7,477 were received as gifts from friends of the Academy and 9,675 were added by the labors of the curator. The principal gifts of the year were: from Dr. F. E. Blaisdell, 1888 specimens of beetles which added 879 species to the Academy collections; from Mrs. Helen Van Duzee, 1387 spiders, mostly from California; from Dr. E. C. Van Dyke, 1280 specimens, largely from Canada and the east; and from Mr. C. L. Fox, 653 specimens, including a fine series of mounted moths. Other contributors to this department include Prof. H. F. Wickham of the University of Iowa; Mr. J. O. Martin, now of Berkeley; Mr. Louis Slevin of Carmel, California; Mr. J. A. Kusche and Mr. M. F. Blassé of San Francisco; Mr. Ralph Hopping of Berkeley, and Dr. Barton W. Evermann, Mr. J. R. Slevin and Mr. John I. Carlson of the Academy staff. The field work of the curator included a four weeks' trip in Shasta and Siskiyou counties, California, and Jackson County, Oregon, the principal localities being Caton, McCloud and Sisson, California, and Colestin, Oregon, and three-day trips to Los Baños, Sacramento, Mt. St. Helena and Cazadero, California. In all but the Los Baños trip he was assisted by his wife, Mrs. Helen Van Duzee, who, in addition to the spiders already mentioned, took many interesting insects which were added to the collections of the Academy.

In reviewing the work accomplished during the past year on the collections of insects we note that the arrangement of the Coleoptera, or beetles, and the determination of the species, is now nearly completed, thanks to the kind assistance of our local students of this order. Early in the year Prof. F. C. Fall of Pasadena worked up the snout-beetles then in our possession; Mr. Ralph Hopping of Berkeley has revised the family Ipidæ comprising the bark beetles, adding from his own collection many species that were lacking, and Dr. E. C. Van Dyke has revised the Buprestidæ, determining the specimens added during the previous year, and bringing this family, which comprises the flat-headed wood-borers, fully up to date. The bulk of the work on the Coleoptera has, however, been done by Dr. F. E. Blaisdell, to whom the Academy is deeply indebted for his efficient and untiring efforts for more than a year past. He has determined or revised and arranged our material in 53 families of beetles, filling 76 of the large insects trays used by the Academy, completing the work on this order of insects with the exception of three families which are now "in the works." Some idea of the magnitude of the task he has so nearly completed may be gathered from the fact that the Academy collection of named North American beetles now numbers 11,625 specimens, representing 2,187 species.

In the Hymenoptera, which embraces the bees, wasps and ants, Dr. J. C. Bradley completed a preliminary study of the various families of the wasps before his return to Cornell University last spring. The Diptera, or two-

winged flies, are in process of determination, most of the important families now being in the hands of specialists for study. The curator has recently begun the determination and arrangement of the Hemiptera, or true bugs, and thus far has completed 15 families numbering 4,064 specimens representing 400 species. In the Lepidoptera, embracing the butterflies and moths, the work of arranging is progressing as rapidly as the material can be sorted over and determined. These insects, as well as the Neuroptera, represented by the dragon-flies, and the Orthoptera, or grasshoppers and their relatives, are larger and their arrangement must await the purchase of sufficient boxes for their display.

So much time was required in mounting and labeling the material added and in assorting and arranging it and the accumulated material, that little was available for systematic study by the curator. One paper on the new forms of Hemiptera brought to light by the work of the previous year was, however, published by the Academy, in which appeared descriptions of 39 new species or races, mostly from California; and a shorter paper on the Hemiptera taken by the Canadian Arctic Exploring Expedition of 1913-1916 was prepared and sent to the Canadian Government at Ottawa for publication in the scientific results of that Expedition.

During the year the exhibition of exotic butterflies in the mammal hall of the Academy was replaced by a much larger collection of exotic forms numbering 248 specimens displayed in riker mounts, and a start was made on three smaller exhibits; one of California butterflies, another of miscellaneous insects showing mimicry and other interesting features, and one of life history and similar groups, and species of economic importance.

In a science dealing with such vast numbers of forms as does entomology the determination of material must be entrusted to specialists. The curator is qualified to do this work in the order Hemiptera, not only in the Academy collection but for other institutions as well, in return for similar help on other orders of insects. In this way the Museum, through the curator, has furnished information or determination of material for the following 23 students:

Dr. W. H. Brittain, Government Entomologist, Truro, N. S.; Mr. H. G. Barber, Roselle Park, N. J.; Dr. William Barnes, Decatur, Ill.; Prof. Geo. A. Coleman, University of California, Berkeley, Calif.; Dr. J. H. Comstock, Los Angeles, Calif.; Mr. E. L. Dickerson, Nutley, N. J.; Mr. Wm. T. Davis, New Brighton, N. Y.; Mr. R. K. Fletcher, Ohio State University, Columbus, Ohio; Mr. W. M. Giffard, Honolulu, T. H.; Dr. Wm. A. Hilton, Pomona College, Claremont, Calif.; Dr. C. Gordon Hewitt, Dominion Entomologist, Ottawa, Ont.; Prof. O. A. Johannsen, Cornell University, Ithaca, N. Y.; Mr. H. H. Knight, Cornell, University, Ithaca, N. Y.; Mr. Philip Lugenbill, Columbia, S. C.; Mr. J. McDonough, Decatur, Ill.; Prof. Z. P. Metcalfe, N. C. Experiment Station, West Raleigh, N. C.; Mr. W. L. McAtee, U. S. Biological Survey, Washington, D. C.; Mr. W. F. Hamilton, Pomona College, Claremont, Calif.; Dr. H. M. Parshley, Smith College, Northampton, Mass.; Mrs. Annie Trumbull Slosson, New York City; Dr. Carl J. Drake, N. Y. State College of Forestry, Syracuse, N. Y.; Dr. F. H.

Lathrop, Oregon Agricultural College, Corvallis, Oreg., and Prof. S. B. Fracker, State Dept. of Agriculture, Madison, Wis.

In return Academy material has been sent for study to the following specialists: Moths of the family Geometridæ to Mr. W. S. Wright of San Diego, Calif.; spiders to Mr. Nathan Banks, Museum of Comparative Zoology, Cambridge, Mass.; the various families of the Diptera, or two-winged flies, to Mr. C. W. Johnson, Director Boston Society of Natural History; Prof. J. S. Hine, Ohio State University, Columbus, Ohio; Prof. A. L. Lovett, Oregon Agricultural College, Corvallis, Oreg.; Mr. R. F. Cole, Bureau of Entomology Laboratory, Forest Grove, Oreg.; and Mr. M. C. Van Duzee, Buffalo, N. Y. Fortunately the Academy has in its own membership specialists well equipped to care for all families of the great order of Coleoptera, or beetles, whose help has already been acknowledged.

More than 30 entomologists from various states and countries have inspected or made use of the collections of the department during the year.

Another feature of the work of this department merits at least a passing notice. During the past year it has been the custom of the curator and his wife, when not absent on necessary field work, to keep "open house," as it were, at the entomological laboratory for both local and visiting entomologists and their friends, so they can meet, make use of the Academy collections, and generally get better acquainted with one another and talk over the work they may be doing. These informal semi-social afternoons have proved so popular that they will be continued, and all members and friends of the Academy interested in insects will be welcome even if they do not technically classify themselves as entomologists.

One word regarding the needs of this department for the coming year. Our first duty is the accumulation of material representing our local insect fauna and its determination and systematic arrangement. We must begin by building up a reference collection of west American insects. Until this is done educational and display work must be done under conditions not economical of time or money. This preliminary work is now well advanced in the order Coleoptera. If a sufficient number of cases can be secured another year should see the Lepidoptera, Hemiptera and Diptera in a condition of similar completeness, leaving but three orders still unassorted, and possibly these might be gotten into fair shape the following year. Further enlargement of the entomological exhibits will be continued as rapidly as properly determined material can be secured.

DEPARTMENT OF HERPETOLOGY

By John Van Denburgh, *Curator*

The Department of Herpetology during the year 1918 progressed satisfactorily, notwithstanding many difficulties occasioned by general conditions, the war, and the epidemic of influenza. The entrance into the Navy of the assistant curator, Lieutenant Slevin, prevented any active collecting during the last half of the year, while the demands of the epidemic greatly reduced the amount of time and thought which the curator could devote

to the work of the department. Nevertheless, the work accomplished compares favorably with that of previous years.

At the beginning of the year 1918 the Academy's collection of reptiles and amphibians numbered 35,451 specimens. There have been added during the year 1921 specimens, so that the collection has grown to more than 37,000 specimens.

The number of specimens added during each of the past six years has been about as follows:

1913	2700	specimens
1914	800	"
1915	800	"
1916	1500	"
1917	1600	"
1918	1724	"

Gifts of specimens during the year have been received as follows:

From Dr. E. C. Van Dyke	163	specimens
" Mr. R. P. Erwin	258	"
" Prof. J. O. Snyder	75	"
" Dr. J. Van Denburgh	19	"
" Mr. P. H. Peters	26	"
" Lord Rothschild	1	"
" Mr. Herbert Pack	2	"
" Other donors	5	"
	549	

Four collecting trips were undertaken to:

1. San Clemente, San Nicolas, Santa Barbara and Santa Catalina islands.
2. Monterey County, California.
3. Pyramid Lake, Nevada.
4. Northern California and southern Oregon.

These expeditions resulted in the acquisition of 1127 specimens.

Aside from the collection made on the islands, specimens have been secured from 17 counties of California, as follows:

Butte	1	specimen
Contra Costa	3	specimens
Del Norte	45	"
Humboldt	14	"
Lassen	37	"
Marin	6	"
Mendocino	39	"
Merced	2	"
Modoc	41	"
Monterey	67	"

San Benito	7	specimens
San Francisco	1	"
San Mateo	3	"
Santa Barbara	1	"
Santa Clara	6	"
Shasta	32	"
Siskiyou	19	"

Specimens from other localities are:

Idaho	488	specimens
Nevada	12	"
New York	163	"
Oregon	580	"
Utah	2	"
Australia	20	"
China	1	"
Hawaii	87	"
Japan	1	"
Philippine Islands	2	"

The classification and arrangement of the collection was continued during the early part of the year.

Considerable research work has been accomplished during the year and a detailed study of the garter-snakes of the states west of the Rocky Mountains has been published.

It is hoped that during the coming year the work of the department may be carried on without interruptions and that field work may be continued for a longer period.

DEPARTMENT OF INVERTEBRATE PALEONTOLOGY

By Roy E. Dickerson, *Curator*

The principal activities of the Department of Paleontology during the past year have been devoted to finishing some work in the Petaluma, Sonoma, and Tomales Quadrangles, photographing new species from Carrizo Creek, San Diego County, completing the numbering and arranging of the Henry Hemphill Conchological Collection, increasing the Academy collection of types and cotypes through exchange, and the procuring of many collections of recent and fossil shells. Mr. Georges Vorbe and Mr. Merle Israelsky have been valuable assistants during the past year.

The Academy published in the year a paper by Professor E. T. Dumble upon the "Geology of the Northern End of the Tampico Embayment Area." Most of the determinations of fossils listed in this paper were made by Dr. W. S. W. Kew and the curator.

The mapping of the Tertiary formations of the Petaluma Quadrangle and the south half of the Santa Rosa Quadrangle, was completed by the curator during the spring. Incidental to this work, the curator cooperated with the

Sonoma County Farm Advisor in searching for limestone suitable for use in liming the adobe lands in this county. The work upon the Petaluma Quadrangle necessitates a connection with the coastal area around Tomales Bay, so that exploring in this region was started. The Point Reyes Triangle, the land mass on the west side of Tomales Bay, had been previously mapped in a most excellent manner by the former curator of the Department, Mr. F. M. Anderson, so the time available was devoted to a study of the east side of Tomales Bay and the headlands which project into the bay. As is well known, the Tomales Bay region is in the San Andreas Rift Zone. Immediately along the recent rift of 1906 some interesting deposits of Pleistocene age were found in the small headlands on the east side of the bay. Study of these beds resulted in the recognition of two formations of Pleistocene age separated by a well marked unconformity. The beds of the lower formation have been so tilted and faulted that dips as high as 30° were recorded in several places. Both of these formations yielded estuarine faunas mixed with wood and pine cones which Miss Eastwood has kindly identified as the Monterey pine *(Pinus muricata)*. These pine cones occur in both formations and they are particularly interesting in that the pine now found in this region is *Pinus radiata,* and not *Pinus muricata,* which does not range this far north at present. Thus the flora indicates that these Pleistocene deposits were probably laid down during a warm interglacial epoch or epochs. This conclusion is further confirmed when the Molluscous fauna is studied. Most of the species of this fauna are now found in the waters of San Diego and are entirely lacking in the waters of Tomales Bay. These faunas are estuarine and likewise the character of deposits are those of a Pleistocene Tomales Bay. That Tomales Bay existed during the Pleistocene, is very evident when the evidence is studied and it seems entirely probable that the Point Reyes Triangle has been subjected to movements quite different to those of the mainland.

The mollusks of the Carrizo Creek beds are being studied and the new species are being described. An Eocene fauna from Peru which was collected by Mr. Clark Gester was found to contain "that finger post of the Eocene," *Venericardia planicosta,* with other interesting forms which have been previously described, but their formal relations were unknown. Mr. Gester recognized this species in the field and thus obtained a key to some of the Peruvian Tertiary problems.

In June, the curator was granted leave by the Academy and was employed by a California oil company in exploration work. Incidental to this work, he obtained several interesting collections from Oregon and Washington which contain a few new forms. Professor Earl Packard, while in charge of the Geology Department of the Agricultural College of Mississippi, made a collection of some fine material from the type locality of the Chipola marl, a celebrated Miocene horizon of Florida. These collections will be particularly valuable to students who are interested in Pacific-Caribbean problems. He collected such material from the Mississippi Cretaceous as well. Professor Packard, who is now located at the University of Oregon, is arranging to collect for the California Academy of

Sciences in the Cretaceous of Oregon. The material so obtained will serve as a basis for the study of Cretaceous problems of this state. This co-operative arrangement will prove beneficial to the University of Oregon as well, as duplicate material will be donated to that institution by the California Academy of Sciences.

Mr. and Mrs. Oldroyd made collections of recent shells from Friday Harbor, Washington, and from Monterey, California. These collections and a collection of recent shells from Magdalena Bay, Lower California, made by Mr. Orcutte of San Diego, comprise an excellent start of a series of typical locality collections on the Pacific Coast.

Mrs. H. M. Barngrover completed the arrangement of the Henry Hemphill Conchological Collections in a very systematic manner, and installed it neatly and compactly in the cases of the department.

There have been a great number of very useful donations during the past year. A complete list of these is appended to the Director's report. Mr. L. E. Smith gave the department a fine collection of minerals. Mr. H. S. Durden has again enriched the department by further donations of rocks and minerals. Mr. H. W. Bell, Deputy Supervisor, Petroleum and Gas, California State Mining Bureau, recently donated an interesting slab of diatomaceous earth from Lompoc, Calif., in which are embedded some fossil fishes.

Several exchanges have been made during the past year. One of these was an exchange between the Academy and the University of Washington. These cotypes from Washington State are now installed in the Type Collection of the Department, where they will prove useful to Pacific Coast workers.

Types from the California State Mining Bureau have been segregated and may be also consulted. It is the purpose of the Department to make the Type Collection as complete and useful as possible.

LIBRARIAN'S REPORT

E. P. Van Duzee, *Assistant Librarian*

During the year just past a very considerable improvement has been made in the condition of the Academy's collection of books. Perhaps most important is the accessioning of the volumes. This work is now well advanced and a few months should see all complete or nearly complete volumes entered. Up to the present about 8,000 volumes have been entered on the accessions register, covering the volumes in the main library room up stairs and those in the departments of Ornithology, Herpetology, Botany and Invertebrate Paleontology. There still remain to be done those in the department of Entomology and in the down-stair stack room. Another improvement that will be much appreciated is the collation and arrangement of the great mass of miscellaneous material in the lower library room, consisting of government, state, and other documents and reports, and the publications of societies not classified as general scientific societies.

In addition to this all single books and many sets of serials not before attended to have been classified, catalogued and the cards filed, so our catalogue is now reasonably complete except for government and miscellaneous institutional reports and publications. Label holders have been attached to the shelves constructed last year for current serials and the 300 and over serials shelved there have been arranged alphabetically and plainly labeled so they are now readily accessible to readers. The work in the library department has been accomplished through the efficient efforts of two assistants who have devoted a portion of their time to this work. Miss Mary E. McLellan takes general charge of the library reading room, enters all serials and exchanges as received on the record cards, keeps them in proper order on the shelves, and makes all entries on the accessions book, while Mrs. Helen Van Duzee has collated, classified and arranged the great mass of miscellaneous documents, reports and serials in the lower library room, including most of the geological surveys and reports and has attended to the classifying and cataloguing done during the year.

The accessions to the library during the past year number 393 complete volumes and a large number of miscellaneous pamphlets, excerpts and odd numbers of serials and society transactions, received by purchase, exchange or as gifts.

As stated last year the most important work before this department is the completion of the work of accessioning the accumulation of material now on hand, for until that is done it will be impossible to make out an intelligent report or to keep track of books currently received. Next in importance is the completion of the card catalogue so it shall cover the departmental libraries and the miscellaneous books in the lower stack room. The addition of about 90 lineal feet of wall shelving at the southwest corner of the lower library room would much facilitate the handling of the books. One suggestion made last year should be again repeated. That is the appropriation of a suitable allowance for the purchase of books for the general and departmental libraries and for the binding of the complete volumes of serials and society publications. A technical library such as this must maintain a constant, even if small, growth.

DEPARTMENT OF INVERTEBRATE ZOOLOGY

By Walter K. Fisher, *Curator*

The work of the department for the year comprised exploration in two widely separated localities, the Lesser Antilles and Puget Sound.

In December, 1917, the curator was invited to accompany an expedition to Antigua and Barbados, British West Indies, organized under the auspices of the Graduate School of the University of Iowa and largely manned by members of the Department of Zoology of that institution. It was decided that the curator would represent the California Academy of Sciences and the Department of Zoology of Stanford University, one-half of the material collected to go to each institution. In addition to this, duplicate

material over and above what should be required by the University of Iowa, the latter institution agreed to furnish available duplicates from the general collections after these had been worked up by specialists.

Professor C. C. Nutting, chief of the expedition (which consisted of nineteen persons) requested the curator to proceed to Barbados in advance of the main party in order to organize suitable quarters. He accordingly did so, sailing from New York April 19, 1918. The main party left about 10 days later.

Extensive shore and shallow reef collections were made in the vicinity of Bridgetown, Barbados, consisting for the most part of the commoner West Indian shallow water forms. The more unusual specimens were of course turned over to the general collections. Dredging up to about 100 fathoms was carried on successfully by Dr. J. B. Henderson, the malacologist of the expedition. The curator accompanied the expedition as expert in Echinoderma, but these animals proving to be not very numerous, his activities covered the entire range of marine invertebrates with the exception of Mollusca, in charge of Dr. Henderson.

After a five weeks' stay at Barbados the expedition moved north to Antigua for a similar period. The base for work was here at English Harbor, an historic fort dating from Nelson's time. The shore collecting proved to be excellent at Antigua, although on account of the prevailing winds dredging was impossible. The number of species encountered at Antigua was not unusually large, but most forms were in abundance.

The expedition arrived at New York August 1, after safely eluding any submarines which might then have been pirating off our eastern coast, and all material reached California in safety.

In the region of Puget Sound Mrs. Ida S. Oldroyd again made a miscellaneous collection of invertebrates at the San Juan Islands, paying more attention to the rarer forms which she did not secure last summer.

ACCESSIONS TO THE MUSEUM AND LIBRARY

Alexander, Miss Annie, Piedmont: Fifty-five numbers of Proceedings, California Academy of Sciences, and two numbers The Philippine Journal of Science. Gift.

Allen, Charles A., San Geronimo: Thirty-five mammal and 20 bird skins from Nicasio, Marin County, California. Gift.

Anderson, Mr. F. M., Berkeley: Miocene fossils from Coalinga district. Gift.

Antonio, Ferraro, San Francisco: One box of inlaid mahogany. Gift.

Berry, Mr. S. Stillman, Redlands: Five pamphlets. Gift.

Bethel, Mr. Ellsworth, San Jacinto: Seven botanical specimens. Gift.

Blaisdell, Dr. F. E., San Francisco: Three hundred and fifty-five named beetles to fill vacancies in the Academy's collection of insects in certain families. Gift.

Bliss, Mr. Walter D.: Two botanical specimens from Plumas County. Gift.

Brackett, Mr. Harvey G., San Francisco: Section of bone found at Saratoga, California. Gift.

Bradley, Dr. J. C., Cornell University: One large, handsome and rare long-horned beetle *(Crioprosopus magnificus)* from New Mexico. Gift.

Budd, Mr. Charles G., San Francisco: One skull of cow elk. Gift.

Buford, Mrs. S. J., San Francisco: One English ring necked pheasant. Gift.

Burbank, Mr. Luther, Santa Rosa: One botanical specimen. Gift.

Burger, Master Albert, Fort Winfield Scott: One Angora hare. Gift.

California Botanical Club, San Francisco: One hundred botanical specimens. Gift.

Campbell, Mrs. Marian L., San Francisco: Eighteen botanical specimens. Gift.

Carlson, Mr. John I., San Francisco: One hundred and thirty-four botanical specimens, 115 insects from Arizona and southern California, marine shells from San Diego, land snails from Santa Barbara County and minerals from Arizona. Exploration.

Cebrian, Mr. J. C., San Francisco: Botanical specimens from Central America, 3 saws of *Pristis perrotti* from Guatemala, 6 mounted specimens of the Armadillo *(Tatu novemcinctum)*, 1 spiny puffer, 1 Alaska Indian totem, 1 mounted specimen of the Jacana, 1 case of 6 mounted birds from Guatemala. Gift.

Chastain, Mr. J. H., San Francisco: Botanical specimens from Siskiyou County, California; chrome ore and asbestos from Siskiyou County. Gift.

Clemens, Mrs. Joseph, Williamsport, Pa.: Six botanical specimens from Pennsylvania. Gift.

Clokey, Mr. Ira D., Denver, Colorado: Seven hundred and one botanical specimens of Marcus E. Jones collections in California, Nevada and Lower California; also 175 botanical specimens from Colorado. Exchange.

Cockerell, Dr. T. D. A., Boulder, Colo.: Sixteen miscellaneous books and pamphlets. Gift.

Creeley, Dr. E. J., San Francisco: One skeleton adult female Indian elephant. Gift.

Dahl, Miss Adele, Tahoe City, California: One Western Goshawk. Gift.

Davidson, Mr. W. M., Sacramento: One Ceria n. sp. from Imperial County. Gift.

Dean, Mr. Walter E., San Francisco: Thirty-one numbers of the Proceedings of the Academy, Fourth Series. Gift.

Dickerson, Dr. Roy E., San Francisco: One package of fossils from Sonoma County, California; one package of fossil shells from Santa Barbara County, California; one package of Oligocene fossils and 33 specimens of fossils; four packages of fossils from the state of Washington. Exploration.

The Dudley Herbarium: One botanical specimen. Gift.

Durden, Mr. H. S., San Francisco: Two boxes and five packages of minerals. Gift.

Eastwood, Miss Alice, San Francisco: One botanical specimen from Golden Gate Park; one botanical specimen from Botanical Garden, University of California; 5 species of exotic plants with duplicates from Golden Gate Park; 392 botanical specimens from various localities; 3 botanical specimens and two exotics from Mount Davidson, San Francisco; 607 botanical specimens from Colorado, Utah, and California; 71 botanical specimens from Mount St. Helena. Exploration.

Ehrhorn, Mr. Oscar, San Francisco: Five fossil shells and three specimens of mineral ores from Bolivia. Gift.

Erwin, Mr. Richard, Boise, Idaho: One hundred and sixteen frogs; 40 snakes; 257 toads; 43 salamanders and 32 lizards from Idaho. Gift.

Essig, Mr. E. O., Berkeley: Five hundred and eighty-two slides of Japanese plant lice. Gift.

Evermann, Dr. Barton Warren, San Francisco: Seventy-four botanical specimens from Crater Lake, and from Santa Catalina, San Clemente, and Santa Barbara islands; 8 insects from northern California; 3 Linnets, 1 Willow Goldfinch and 1 Western Savannah Sparrow; 1 snake from Golden Gate Park. Exploration. A miscellaneous collection of shells, corals, minerals, fossils, Indian arrowheads, beads, etc., and various other natural history objects totaling altogether more than 500 specimens chiefly from Alaska, Indiana, Texas, North Carolina, and Porto Rico. Gift. One snake from San Mateo County, one snake from Merced County, and three frogs from San Benito County. Exploration.

Fauntleroy, Miss Sophie, Nordoff: Nine botanical specimens. Gift.

Ferris, Mr. G. F., Stanford University: One entomological specimen mounted on slide of *Hesperoctenes longiceps* Waterh. Gift.

Folger, Mr. A. S., Berkeley, and Dickerson, Dr. R. E.: Fossils from Washington. Exploration.

Fox, Mr. C. L., San Francisco: Six hundred and fifty-three insects, mostly Diptera. Gift.

Frison, Mr. Theodore H., Champaign, Illinois: Forty-three entomological specimens. Exchange.

Gallon, Mr. G., Hollister: One badger. Gift.

Gester, Mr. G. C.: Fossils from Peru. Gift.

Gillon, Mrs. E. E., San Francisco: One tusk of walrus. Gift.

Godfrey, Mr. F. L., Supt., Kahlin Reserve, Australia: Eighty-six specimens of minerals; 3 pearl oyster shells; 5 boomerangs; 3 wristbands; 1 emu skin rug; 3 nets; 1 mat flag; 17 wooden implements; 1 metal bayonet with wooden scabbard; 1 hair ornament; 1 wall-pocket case. Gift.

Golden Gate Park: One California Condor, and one young kangaroo. Gift.

Goldsmith, Mr. Oliver: One botanical specimen. Gift.

Gordon, Mr. W.: Fossils from San Luis Obispo. Gift.

Heath, Dr. Harold, Stanford University: Nineteen botanical specimens from Forrester Island, Alaska. Gift.

Herrin, Miss Alice, San Francisco: One botanical specimen. Gift.

Herrin, Mr. William F., San Francisco: Eighteen botanical specimens. Gift.

Holm, Mr. Adolph, San Francisco: Four botanical specimens. Gift.

Holzinger, Mr. John M., Winona, Minn.: Holzinger's set of Sandberg's collection of Plants of Idaho, consisting of 955 mounted specimens and 200 unmounted specimens. Purchase.

Hopping, Mr. Ralph, Berkeley: Thirty specimens of tropical longhorned Coleoptera. Gift.

Hunt, Mr. H. H., Escalon: One bat. Gift.

Israelsky, Mr. Merle, San Francisco: One arrow-head from Frankfort, Kansas. Gift.

Jones, Mr. J. M., Wilmington, Delaware: Twenty-six entomological specimens from northern California. Gift.

Kusche, Mr. J. August, San Francisco: One hundred and two insects, chiefly from Alaska and Arizona; 87 mammal skins, chiefly from California and Alaska; 337 bird skins, chiefly from California and Alaska. Gift.

Lazansky, Mr. Bernhard, San Francisco: Relic of the great fire of April, 1906; a nickel in slot of telephone box. Gift.

Liebes, Mr. I., San Francisco: Three pieces of fur illustrating method of preparing mink skins for garments. Gift.

Levin, Mrs. A. L., San Francisco: Sixty-six Indian spear and arrow-heads. Gift.

Lewis, Mr. W. C., Tiburon: One caribou head from Alaska. Gift.

Lockefeer, Mr. C. J., San Francisco: One lizard from San Mateo County. Gift.

Maag, Mr. Fred, San Francisco: One snake from Marin County, California. Gift.

Markley, Mrs., San Antonio, Texas: Three botanical specimens. Gift.

Martin, Mr. J. O., Berkeley: One hundred and thirty-two insects, including a pair of *Dinapate wrighti* and four examples of *Schizax senax,* both rare California beetles. Gift.

McAllister, Mrs. Leonore M., Ydalpom: Forty-seven botanical specimens. Gift.

McGuire, Mr. Ignatius, San Francisco: One lizard from Santa Barbara County and one snake from Marin County. Gift.

Meiere, Mrs. Ernest, San Francisco: Three botanical specimens (one from Yellowstone). Gift.

Menzies, Mr. Robert, San Rafael: One botanical specimen. Gift.

Merriam, Dr. C. Hart, Washington, D. C.: Twenty botanical specimens. Gift.

Merrill, Mr. E. D., Manila, P. I.: Fifty-five miscellaneous books and pamphlets. Gift.

Merritt, Dr. George W., San Francisco: One specimen Sipunculoidea. Gift.

Miller, Mrs. C. E., Berkeley: One hundred and two botanical specimens from the Santa Cruz Islands. Gift.

Miller, Mr. Irving, Berkeley: Thirteen botanical specimens. Gift.

Neilson, Mr. Fred, San Francisco: One crab, caught in Bristol Bay, Alaska. Gift.

New York Botanical Garden: Sixty-four specimens of plants from Jamaica and 65 specimens of grasses. Exchange.

Nomland, Mr. J. O., Los Angeles: One box of pliocene and miocene fossils from Los Angeles County. Gift.

Noyes, Mr. Russell: Forty-one botanical specimens from Afoguak, Alaska. Gift.

Oldroyd, Mrs. Ida S., Stanford University: One hundred and forty-three botanical specimens from Michigan. Gift; and 406 specimens of shells. Exploration.

Otis, Mr. Ira C., Seattle, Wash.: Sixty-seven botanical specimens from Cascade Mountains. Gift.

Pack, Mr. Herbert J., Salt Lake City, Utah: Two snakes from Utah. Gift.

Packard, Dr. E. L., Eugene, Ore.: One box of fossils from Florida and Mississippi. Exploration.

Page, Mrs. George T., San Francisco: Three walrus ivory bows, 2 pestles, and 1 pipe. Gift.

Palache, Mr. T. H., San Francisco: One photograph of *Pinus lambertiana*. Gift.

Palmer, Mr. Andrew H., San Francisco. Three books. Gift.

Perkins, Dr. Anne E.: Three botanical specimens. Gift.

Peters, Mr. Peter, San Rafael: Forty entomological specimens from Queensland, and 26 herpetological specimens from various localities. Gift.

Ploud, Mr. Wm., San Francisco: One Blue Mountain Parrot from Australia. Gift.

Reed, Mr. C. E., Santa Cruz: Five botanical specimens. Gift.

Reeve, Miss Enid, Pasadena: Six botanical specimens. Gift.

Reynolds, Mrs. L. R., Brockton, Mass.: Three botanical specimens. Gift.

Rixford, Mr. G. P., San Francisco: Three botanical specimens. Gift.

Robinson's Bird Store, San Francisco: One chimpanzee. Gift.

Rothschild, Hon. Walter, Tring, England: One tortoise cast. Gift.

Sandford, Mr. O. N., San Francisco: Thirty-eight botanical specimens from Arizona and southern California. Gift.

Scupham, Mr. John R., Oakland: A small quantity of crude black sand from the delta of the Klamath River, a small quantity of sand from upper ancient beach on Sixis River, Oregon, and a small package of sand from beach at Pandon, Oregon. Gift.

Silviera, Captain J. F., Centerville: One shell from the Caroline Islands and 5 rattlesnake rattles. Gift.

Slevin, Mr L. S., Carmel: Forty-one insects from Paso Robles and Carmel and 130 insects from Monterey County. Gift.

Slevin, Mr. Joseph R., San Francisco: Sixty-five beetles from Crater Lake, Oregon; 227 insects from Channel Islands, mostly from San Clemente; 1 snake from San Mateo County; 3 snakes from Santa Clara County; 9 snakes from Monterey County; 58 lizards from Monterey County; 10 lizards and 2 snakes from Pyramid Lake, Nevada; 1 snake and 2 lizards from vicinity of Mt. Diablo. Exploration.

Smith, Mr. L. E., Sisson: One hundred and ninety-seven books and pamphlets, also various numbers of Academy Proceedings; 14 botanical specimens, 2 boxes of minerals. Gift.

Snyder, Prof. J. O., Stanford University: One salamander from Stanford University; 50 lizards from Honolulu; 15 lizards from Aiea; 7 lizards from Yam Bay, Niihau Island; 2 lizards from Waimea, Kauai Island; 1 snake from Japan and 1 snake from China. Gift.

Stanford University: One botanical specimen. Gift.

Stewart, Miss Colleena, San Francisco: Six botanical specimens. Gift.

Southern Pacific Company: Set of 55 colored slides of the Apache Trail. Gift.

Sullivant Moss Society, New York, N. Y.: Seventy-five specimens of lichens. Purchase.

Sutliffe, Mrs. E. C., San Francisco: Eleven botanical specimens. Gift.

Thompson, Mr. David G.: One botanical specimen, and 6 botanical specimens from Mojave Desert. Gift.

Thompson, Mr. Hugh, San Francisco: One turtle from California. Gift.

Thompson, Mr. J. C.: Snails from Lower California. Gift.

Thompson, Mrs. Lillian Dyer, Swampscott, Mass.: Two slides showing the raduli of *Melongena corona* and *Aplysis protea*. Gift.

Thrasher, Dr. Marion, San Francisco: One old property deed to 80 acres of land in the State of Indiana given in 1823 to John Smeltser of Barbour County, Kentucky, by the President, James Monroe. Gift.

Tucker, Mr. J. F., Tucson, Arizona: Two Indian spear heads, one broken pestle and two pieces of quartz. Gift.

Turner, Mrs. G. M., Riverside: One botanical specimen. Gift.

Turrill, Mr. Charles B., San Francisco: One chinchilla; 1 stone crab from near the Farallones; Journals and Letters, David Douglas. Gift.

United States Custom House, San Francisco: Sixty-three packages of mounted birds, bird skins and bird feathers, seized by Customs Office. Gift.

United States National Herbarium: One box of botanical specimens. Exchange.

Van Denburgh, Dr. John, San Francisco: One snake from Merced County; 1 toad from Hollister; 2 lizards and 1 salamander from San Juan; 15 lizards from Honolulu and 2 salamander skeletons from Los Gatos. Exploration.

Van Denburgh, Dr. John, and Slevin, Mr. Joseph R.: Two hundred and fourteen lizards from San Clemente Island; 2 lizards from San Nicolas Island; 24 lizards from Santa Catalina Island; 58 lizards, 59 snakes, 5 toads, 15 frogs and 49 salamanders from California; 67 lizards, 5 toads, 13 snakes, 14 frogs, 478 salamanders, and 3 turtles from Oregon. Exploration.

Van Duzee, Mr. E. P., San Francisco: Forty-five freshwater shells from Titch ranch, four miles west of Cayton, Shasta County; 413 beetles from Eastern states. Gift. 24 insects collected at Milbrae; 43 insects collected at Ingleside; 667 insects collected at Cazadero; 4247 insects collected in field trip to Ashland, Oregon; 411 insects from Cazadero; 828 insects from Gadwall; 616 insects from Sacramento; 876 insects from Mt. St. Helena, and 1900 insects from various localities. Exploration.

Van Duzee, Mrs. Helen, San Francisco: Nine hundred and forty-three spiders taken in the counties about San Francisco Bay. Gift.

Van Dyke, Dr. E. C., Berkeley: One thousand one hundred and thirty-two insects from Ithaca, New York; 42 insects from Banff, Canada; 88 insects from Port Coulange, Quebec; 149 salamanders, 10 frogs and 4 snakes from Ithaca, New York; snails from Ithaca, New York; sea shells from Alaska. Gift.

Varrelman, Mr. Ferdinand A., San Francisco: Fifty bound volumes, 15 unbound volumes, 533 numbers of Government bulletins, reports, etc., and publications of Societies, 111 miscellaneous pamphlets and excerpts. Gift.

Verrill, Prof, A. E., New Haven, Conn.: Twenty-four insects and 5 larvæ from the outflow of a warm artesian well near Carson, Nevada. Gift.

von Hoffman, Mrs. C., San Francisco: Four pamphlets. Gift.

Waizman, Miss Olga: One botanical specimen. Gift.

Weeks, Mr. Andrew Gray: Two volumes. Gift.

Wetherill, Miss Martha, Chin Lee, Arizona: One botanical specimen. Gift.

Wickham, Prof. H. F., Iowa City, Iowa: Three hundred and sixty-three specimens of Coleoptera. Gift.

Willett, Mr. G., Los Angeles: One hundred and ninety-nine shells from Forrester Island, Alaska. Gift.

Woodrum, Mr. J. H.: Vegetable ivory from Ecuador. Gift.

Wooster, Mr. John, San Francisco: One Indian spearhead from Indian mound in Marin County, California. Gift.

FINANCIAL STATEMENTS

REPORT OF THE TREASURER

for the fiscal year ending March 31, 1919

April 1, 1918, Balance with Crocker National Bank..	$ 1,199.92

Receipts

Dues	$ 1,267.25	
Charles Crocker Scientific Fund Endowment Income	1,194.76	
James Lick Endowment Income	48,083.11	
General Income	15,000.00	
John W. Hendrie Income Account	675.00	
A. K. Macomber Donation	500.00	
W. G. Wright Fund	57.20	
Sundry Advances	9.08	
Insurance	3.87	
Museum	145.96	
Publication	310.72	
Post Card Sales	674.86	
		67,921.81
		$69,121.73

REPORT OF THE TREASURER—*Continued*

Receipts

Brought forward,—total receipts		$69,121.73

Expenditures

Expense	$ 2,378.54	
General Salary Expense	13,050.00	
Bills Payable	14,000.00	
Insurance	579.40	
Interest	15,394.64	
Museum Department Appropriations	6,835.05	
" " " Salaries	9,668.46	
Library	542.33	
Publication	4,441.07	
Museum Construction	422.00	
Office Furniture	263.04	
Tools and Equipment	37.93	
Post Cards Purchased	333.40	
Sundry Creditors	47.68	
Sundry Advances (Museum)	1,790.23	
White Pelican Group	161.44	
Contingent Fund	217.74	
		70,162.95
March 31, 1919, Balance due Crocker National Bank		$ 1,041.22

RUDOLPH J. TAUSSIG, *Treasurer.*

We have examined the foregoing Report of the Treasurer for the fiscal year ended March 31, 1919, with the books and accounts of the California Academy of Sciences, and we have found the same to be correct.

McLAREN, GOODE & Co., *Certified Public Accountants.*

San Francisco, Cal., April 21, 1919.

INCOME AND OPERATING EXPENSES

for the period April 1, 1918, to March 31, 1919

Income

Charles Crocker Scientific Fund Endowment Income	$ 1,194.76	
James Lick Endowment Income	48,083.11	
General Income	15,000.00	
Dues	1,267.25	
		$65,545.12

Expense

Salaries		21,942.25	
Expense, General	$970.33		
Fuel	604.46		
Electricity	218.73		
Telephone	279.45		
Postage	250.56		
Stationery and Printing	238.01		
		2,561.54	
Insurance		575.53	
Interest		15,394.64	
			40,473.96
Surplus for year 1918-19			$25,071.16

BALANCE SHEET

March 31, 1919

Assets

Real Estate:		
Market Street Lot	$600,000.00	
Jessie Street Lot	8,083.65	
Commercial Building	516,818.66	
		$1,124,902.31
Stocks:		
45 Shares Savings Union Bank & Trust Co.		10,000.00
Museum Construction		191,210.92
Museum:		
General Collections	91,119.91	
Tools and Equipment	14,909.48	
		106,029.39
Library:		
Books and Equipment	16,046.42	
Publication	17,880.76	
		33,927.18
Office Furniture		3,009.14
Post Cards in Stock		179.72
Sundry Advances		50.00
		$1,469,308.66

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Endowments:		
James Lick Endowment	$804,902.31	
Charles Crocker Scientific Fund Endowment	20,000.00	
John W. Hendrie Endowment	10,000.00	
		$ 834,902.31
John W. Hendrie Endowment Income Account		3,498.98
Alvord Bequest Botanical		5,000.00
A. K. Macomber Donation		3,500.00
William H. Crocker Donation		2,318.73
W. B. Bourn Donation		2,659.31
J. D. Grant Donation		2,610.42
Herbert Fleischhacker Donation		3,500.00
W. G. Wright Fund		240.40
Bills Payable		305,275.00
Sundry Creditors		931.32
Cash:		
Overdraft with Crocker National Bank	1,041.22	
Less Cash in Safe	72.11	
		969.11
Surplus		303,903.08
		$1,469,308.66

W. W. SARGEANT,
Secretary of the Board of Trustees.

AUDITOR'S CERTIFICATE

We have examined the foregoing Balance Sheet, together with the books and accounts of the CALIFORNIA ACADEMY OF SCIENCES, and in our opinion it is properly drawn up so as to exhibit a true and correct view of the Academy's affairs, as shown by the books.

McLAREN, GOODE & Co.,
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San Francisco, Calif.,
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